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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,481	01/31/2002	Hugh R. Kurth	SUN - P7036	3526

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EXAMINER

LU, KUEN S

ART UNIT	PAPER NUMBER
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2177

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

19

# Office Action Summary

Application No.

10/066,481

Applicant(s)

KURTH, HUGH R.

Examiner

Kuen S Lu

Art Unit

2177

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## ***DETAILED ACTION***

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1 and 9 are rejected under 35 U.S.C. 102(e) as anticipated by Sangha et al. (U.S. Publication 2002/0176430, hereafter "Sangha").

As per claims 1 and 9, Sangha teaches the following:

"providing a plurality of pointers to the data buffer, each pointer associated with an area of the buffer" at Page 1, [0012] by using one queue for storing pointers pointing to data buffers which are shared by communication processes to receive packets, and another queue for storing pointers pointing to data buffers which are shared by communication processes to transmit packets; and

"creating a given queue by associating a given pointer from the plurality of pointers with the given queue" at col. 2, [0016] where a queue for write is created by storing freed data pointers pointing data buffers in external memory.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-6, 8, 10-14, 16 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sangha et al. (U.S. Publication 2002/0176430, hereafter "Sangha"), as applied to Claims 1 and 9, and in view of Kao (U.S. Publication 2003/0037096).

As per claims 2 and 10, Sangha does not specifically teach "a free pointer linked list", although Sangha teaches "storing the plurality of pointers" by implementing Read Free Queue to include free pointers at Page 2, [0014] and "providing a plurality of pointers" at Page 1, [0012] by using queues for storing pointers to data buffers.

However, Kao teaches creating and maintaining a linked list of buffer at Page 1, [0005].

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention was made to combine Kao's reference with Sangha's by storing pointers in a free pointer linked list because both references are devoted to data buffer queue management (KAO: Abstract showing managing buffer queue to store data queue; Sangha: Abstract showing managing data packets in data buffers pointed by pointers storing in queue) and by doing so the data buffers can be rapidly added or removed from the queue since the list is linked. Furthermore the dynamic management of data buffers and queue would have helped in efficiently utilizing a limited size of on-chip memory should the buffers implemented on memory (Kao: [0008], Sangha: [0014]).

As for claims 3 and 11, Kao further teaches “associating the given pointer includes removing the given pointer from the free pointer linked list” at Page 5, [0057] where data elements are removed from data queue, buffer is recycled and the pointer is reset.

As for claims 4 and 12, Kao further teaches “associating the given pointer further includes storing the pointer in a given queue linked list” at Page 1, [0004] where buffers are associating buffer to memory locations and queued by linked lists.

As per claims 5, 13 and 18, Kao further teaches “removing the given pointer from the queue linked list and adding the given pointer to the free pointer linked list to delete a member of the given queue” at Page 5, [0057] by removing data from the data queue, recycling the buffer and resetting the pointer.

As per claims 6 and 14, Sangha further teaches “the given queue is a FIFO queue” at Page 3, [0034] where a buffer management queue has a write FIFO and read FIFO.

As per claims 8 and 16, Kao teaches “the free pointer linked list and the given queue linked list are stored in a given data structure” at Fig. 3, elements 41 and 46 where cache structures are provided to store the beginning of utilized linked list of buffers and the beginning of the free linked list of buffers.

As per Claim 17, Sangha teaches the following:

“a shared data buffer” at Page 1, [0010]-[0012] by utilizing data storage units as data buffers to store communication packets shared by communication processes to store and transmit data packets; and

“a pointer array pointing to a plurality of areas of the data buffer” at Page 1, [0012] by using one queue for storing pointers to a data buffer.

Kao further teaches the following limitations of Claim 17:

“a free list data structure including an entry count, a head pointer to the data buffer and a tail pointer to the data buffer” at Fig. 3, elements 41 and 46 where cache structures are provided to store the beginning of utilized linked list of buffers and the beginning of the free linked list of buffers.

“a queue state including a plurality of virtual queue data structures, each queue data structure including a queue entry count, a queue head pointer and a queue tail pointer, the queue head pointer and the queue tail pointer pointing to areas of the data buffer” at Page 1, [0006] where head pointer and tail pointer are store at the first and second locations, and at Page 4, [0046] where a count of data elements in the data queue is stored in a dummy buffer; and

“logic for deleting an entry from the free list data structure and adding the entry to a given virtual queue data structure” at Page 4, [0043]-[0044] by using ‘recycle then read’ and ‘read then recycle’ to manage a buffer queue.

3. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sangha et al. (U.S. Publication 2002/0176430, hereafter “Sangha”) in view of Kao (U.S. Publication 2003/0037096), as applied to claims 2-6 and 10-14, and in further view of Oksanen (U.S. Publication 2002/0116568).

As per claims 7 and 15, the combined Kao-Sangha reference does not teach a LIFO queue, although Kao teaches FIFO queue at Page 3, [0034].

However, Oksanen teaches “given queue is a LIFO queue” at Page 2, [0011] by applying both FIFO and LIFO queues.

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention was made to combine Oksanen's reference with Kao and Sangha's including LIFO queue in the queue disciplines because all the three references are devoted to buffer, queue and pointer management (KAO: Abstract showing managing buffer queue to store data queue; Sangha: Abstract showing managing data packets in data buffers pointed by pointers storing in queue; Oksanen: Abstract showing implementation of double-ended queue in a memory and memory management system). The combination of references would have allowed a memory element be added as the first element of the buffer forming the front end of the queue, or as the last element of the buffer forming the tail end of the queue, by algorithms of LIFO and FIFO implementations. The inclusion of both FIFO and LIFO queues in the queue discipline would have provided flexibility to queue, buffer and pointer management.


### ***Conclusions***

4. The prior art made of record
  - A. U.S. Publication 2002/0176430
  - B. U.S. Publication 2003/0037096
  - C. U.S. Publication 2002/0116568


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- D. U.S. Patent 5,230,071

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuen S Lu whose telephone number is 703-305-4894. The examiner can normally be reached on 8 AM to 5 PM, Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Kuen S Lu  
  
Patent Examiner

May 25, 2004

  
SRIRAMA CHANNAVALJALA  
PRIMARY EXAMINER